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The effect of financial innovation on European banks' risk☆

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ABSTRACT

This study examines the effect of the use of securitization and credit derivatives on the risk profile of European banks. Using information from 134 listed European banks during the period of 2006–2010, the results show that securitization and trading with credit derivatives have a negative effect on financial stability. The main findings also show the dominance of trading positions over hedging positions for credit derivatives. The results of this study support the higher capital requirements of the new Basel III international banking regulations. Furthermore, accounting measures do not readily indicate market risks, and thus the results support central banks' use of market-solvency measures to monitor financial stability.

1. Introduction

Recent economic theory presents two opposing views on the effects of securitization and credit derivatives on bank soundness. Some authors argue that both instruments improve financial stability, while others associate these processes with financial fragility. The securitization market could serve as a risk transfer mechanism and could therefore strengthen institutional solvency. Nevertheless, securitization potentially encourages the expansion of poorer quality credit and, therefore, impairs financial stability simultaneously. For credit derivatives in particular, although buying protection may intuitively reduce risk, the effect is not so great for intermediaries or those who sell protection. Norden, Buston, and Wagner (2011) highlight the scant evidence of the channels through which financial innovations affect financial institutions in adverse circumstances.

From these two views, and given the scarcity of empirical work, the question arises as to whether the financial innovations of securitization and credit derivatives affect the risk profile of European banks. Basel III, the new capital rules, increase capital requirements for both financial innovations. In this sense, researchers must determine whether empirical analysis supports an increase in capital requirements. Additionally, risk analyses drawing from market indicators or accounting may differ, hence the need to assess the risk of financial innovation considering both measures.

This work contributes to the existing literature by presenting unpublished evidence of the effect of securitization and credit derivatives on the default probability of listed European banks. Despite the importance of this issue, most existent studies focus on the US market and have a different focus in their analyses. This study uses Moody's expected default frequency (EDF) as a continuous measure of the probability of default, and Z-score as a risk-accounting measure. Further, the database of this study uses previously unused data with a more detailed breakdown of derivative positions available in the US market. Finally, the dynamic panel data methodology permits to control for endogeneity problems.

The organization of the article is as follows: first, the next section summarizes the main existing research on the effect of securitization and credit derivatives on banking; second, Section 3 describes the empirical analysis; defines the independent, dependent, and control variables; and provides a descriptive analysis of the sample; third, Section 4 presents the statistical model and shows the contrast between the hypotheses and the main results. Finally, Section 5 discusses conclusions and further topics of research.

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Table 1
Overview of the work on the effect of the use of securitization and credit derivatives.

Author(s)	Area of study	Region	Period	Methodology	Effect on financial stability
Greenbaum and Thakor (1987)	Securitisation			Theoretical analysis	(−)
Lockwood et al. (1996)		US	1985–1992	Events study	(+/−) depending on size
Cebenoyan and Strahan (2004)		US	1987–1993	Fixed effect	(+)
Instefjord (2005)				Theoretical analysis.	(+/−) depending on reinvestment
Uzun and Webb (2007)		US	Quarterly Data 2001	Panel data	+/− depending on the product
Krahnen and Wilde (2006)		–	–	Structural one-factor correlated default model.	(−)
Leland (2007)				Panel data	(−)
Hänsel and Krahnen (2007)	CDO	Europe	1997–2004	Standard event studies	–
Jiangli et al. (2007)	CLOs	–	–	Tobit regression.	(+/−) depending on risk distribution
Michalak and Uhde (2009)	Securitisation	Europe	1997–2007	Panel data	(−)
Shin (2009)				–	(−)
Michalak and Uhde (2012)		Europe (EU-13)	1997–2007	Panel data.	(−)
Otero et al. (2013)		Spain	2004–2008	Panel data. (GMM)	(−)
Duffee and Zhou (2001)	CDS			Theoretical analysis.	(+/−) depending on asymmetric information and adverse selection
Instefjord (2005)	Credit derivatives			Theoretical analysis.	(+/−) depending on market price elasticity
Morrison (2005)				Theoretical analysis.	(−)
Gibson (2007)				Theoretical analysis.	(−)
Shao and Yeager (2007)		US	1997–2005	Panel data	(−)
Minton et al. (2009)		US	1999–2005	Probit regression.	(+/−) depending on derivatives net position
Heyde and Neyer (2010)	CDS			Theoretical.	(−)
Stulz (2010)	CDS			Theoretical.	Neutral
Nijskens and Wagner (2011)	CLOs CDSs	Europe, North-America Asia, Australia	1998–2005	Theoretical.	(−)
Rodríguez et al. (2015)	Credit derivatives	Europe	2006–2010	Panel data. (GMM)	(+)

2. Literature review

Several studies highlight the fact that securitization is a stabilizing mechanism of the bank soundness (Jiangli, Pritsker, & Raupach, 2007). The studies that support this view explain that the reinvestment process can lead to greater diversification when reinvesting the resources in new conservative assets (Cebenoyan & Strahan, 2004). Other studies highlight the fragility of the reinvestment process, since most of the credit risk occurs in the first-loss tranche, which usually remains on the bank's balance sheet (Greenbaum & Thakor, 1987; Instefjord, 2005; Michalak & Uhde, 2012; Otero, Ezcurra, Martorell, & Mulet, 2013; Riddiough, 1997). Furthermore, if banks use the new resources to increase the asset base at a higher rate, to repurchase shares, or to pay a higher dividend, securitization can create an even greater leverage in the originator bank (Leland, 2007; Shin, 2009).

However, the existent evidence does not give conclusive results of the effects of securitization. On the one hand, several studies argue that securitization has a positive effect in general (Jiangli & Pritsker, 2008; Uzun & Webb, 2007) and on systematic risk (Franke & Krahnen, 2007; Hänsel & Krahnen, 2007; Lockwood, Rutherford, & Herrera, 1996; Michalak & Uhde, 2012). On the other hand, the literature on credit derivatives also contains contradictory views. Norden et al. (2011) highlight the difficulty of knowing a priori the effect of credit derivatives on financial stability. Batten and Hogan (2002), JP Morgan (2006), Mengle (2007), Angelini (2012), and Rodríguez, Otero, Cantorna, and Durán (2015) support the classic positive view that these products help reduce banks' risk, providing the best possible diversification and risk reduction, increased efficiency, greater liquidity, and transferring credit risk in the markets. However, a significant body of work supports the contrary view that entities may relax their

Table 2
Variables and hypotheses.

Varia	Prediction		Definition	Source
	EDF and credit risk proxies	*Z-Score*		
Expected default frequency to 1 year *[EDF1Y]*	Dependent variable		$PD = \phi[-DD]$	Moody's
Total risk of default *[Z-Score]*	Dependent variable		Ratio of the sum of equity capital to total assets and ROAA divided by the standard deviation of ROAA (sdROAA)	Bankscope, Authors' calculation
Securitization *[Securitiza]*	+	−	Outstanding balance of securitized assets/gross loans	Annual report and
Total net position *[totalnetpos]*	+	−	Total net position of credit derivatives/credit portfolio	Pillar III disclosures
Net position of trading *[tradnetpos]*	+	−	Net position of credit derivatives in the trading portfolio/credit portfolio	
Net position of hedging *[hedgingnet]*	−	+	Net position of credit derivatives in the hedging portfolio/credit portfolio	
Gross position credit derivatives *[cdgrosspos]*	+/−	+/−	Gross position of credit derivatives/credit portfolio	
Size *[Logtotalac]*	−	+	Log (total assets)	Bankscope
Profitability *[ROAA%]*	−	+	Net income/average total assets	
Net interest margin % *[Netinteres]*	−	+	(Interest income − interest expense)/assets	
Efficiency ratio % *[CosttoInco]*	+	−	Cost to income	
Liquidity % *[Liquidity]*	−	+	Liquid/deposits and short-term funding	
Credit portfolio % *[Netloansto]*	+	−	Net lending/total assets	
Gross loans to assets *[Grossloantoasset]*	+	−	Gross loans/total assets	
Equity ratio *[Equitytoas]*	+/−	+/−	Equity/total assets	
Gap assets and short-term liabilities *[GAP]*	+	−	(Liquid assets − deposits & short-term funding)/total assets	

Note: In this case, the signs that appear in the table refer to the relationship between the different variables and the variables global risk *EDF* and *Z-score*. The proxy for credit risk is the same as that for the variable *EDF*.

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